

Amendment

Application No. 10/036,994 (09792909-5279)

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IN THE SPECIFICATION

Please replace the paragraph beginning on page 31 and ending on page 32 with the following replacement paragraph:

As shown in FIGS. 14 and 15, the substrate P is moved to the substrate holder 8B by using the moving arm, and a sacrificesacrificial layer 61 made from copper or the like is selectively formed to a thickness of about 40 nm on a nearly central portion of the surface reformed layer 21 by the treatment source 3 (DC sputter source). The sacrificesacrificial layer 61 is formed into, for example, a rectangular shape in a plan view. The sacrificesacrificial layer 61 is a layer for temporarily supporting a carbon thin film 62 (see FIGS. 16 and 17) to be formed on the sacrificesacrificial layer 61 in the subsequent step, and which is to be dissolved and removed by the etchant E at the time of wet etching treatment.

Please replace the paragraph beginning and ending on page 32 with the following replacement paragraph:

As shown in FIGS. 16 and 17, like the second embodiment (see FIG. 9), the substrate P is moved to the substrate holder 8C by using the moving arm, and a carbon thin film 62, for example, a ta-C thin film is formed to a thickness of about 100 nm so as to cover the substrate P by the treatment source 4 (FCVA ion source). A portion, formed on the sacrificesacrificial layer 61, of the carbon thin film 62 is higher than the remaining portion of the carbon thin film 62.

Please replace the paragraph beginning on page 32 and ending on page 33 with the following replacement paragraph:

As shown in FIGS. 18 and 19, the substrate P is moved to the substrate holder 8A by using the moving arm, and a mask 63 having an opening 63U having, for example a U-shape is placed on the carbon thin film 62. The size of the opening 63U is set to correspond to the size of the sacrificesacrificial layer 61 (see FIG. 19).

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Please replace the paragraph beginning and ending on page 33 with the following replacement paragraph:

As shown in FIGS. 20 and 21, the substrate P is subjected to dry etching treatment via the opening 63U of the mask 63 by the treatment source 2 (for example, oxygen ions N₂), to selectively remove the carbon thin film 62 until the sacrificesacrificial layer 61 is exposed, thereby forming an opening 62U.

Please replace the paragraph beginning on page 33 and ending on page 34 with the following replacement paragraph:

After the mask 63 is removed, the substrate P is dipped in the etchant E like the wet etching treatment in the first embodiment (see FIG. 6). According to this embodiment, however, a ferric chloride solution which cannot dissolve the surface reformed layer 21 and the carbon thin film 62 but can dissolve the sacrificesacrificial layer 61 is used as the etchant E. With this wet etching treatment, only the sacrificesacrificial layer 61 (layer to be etched) is selectively dissolved. Consequently, as shown in FIGS. 22 and 23, a fine beam structure having a beam portion 62R is formed. One end portion of the beam portion 62R is supported by the substrate P and the other end portion thereof is separated from the other portion of the carbon thin film 62 and the substrate P. In this wet etching treatment, since the surface reformed layer 21 functions as a protective material for preventing the substrate P from being dissolved, the substrate P is not dissolved by wet etching. Finally, the substrate P is removed out of the etchant E, and is dried.

Please replace the paragraph beginning and ending on page 34 with the following replacement paragraph:

According to this embodiment, since the surface reformed layer 21 is used as a protective material for preventing the substrate P from being dissolved by wet etching and the sacrificesacrificial layer 61 is removable by wet etching-is-used, a fine beam

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structure can be accurately formed while preventing the substrate P from being dissolved. Of course, various micro-machines can be formed by making use of the substrate P having the beam structure.

Please replace the paragraph beginning and ending on page 35 with the following replacement paragraph:

Although in this embodiment, copper is used as the material of the sacrificesacrificial layer 61 and the ferric chloride solution is used as the etchant E, the present invention is not limited thereto. That is to say, the materials of the sacrificesacrificial layer 61 and the etchant E can be freely changed insofar as a solution which cannot dissolve the components (for example, the surface reformed layer 21 and the carbon thin film 62) other than the sacrificesacrificial layer 61 but can dissolve the sacrificesacrificial layer 61 is used as the etchant E. In addition, according to this embodiment, like the first embodiment, a solution having such a selective dissolution characteristic that a selection ratio of etching of the sacrificesacrificial layer 61 to etching of the surface reformed layer 21 and the carbon thin film 62 is high may be used. In this case, the same effect as that obtained by the first embodiment can be obtained by making use of a difference in dissolution characteristic.